



Rayce 

ARAYMOND CENTER OF EXPERTISE

IN COLLABORATION WITH

micr°pelt

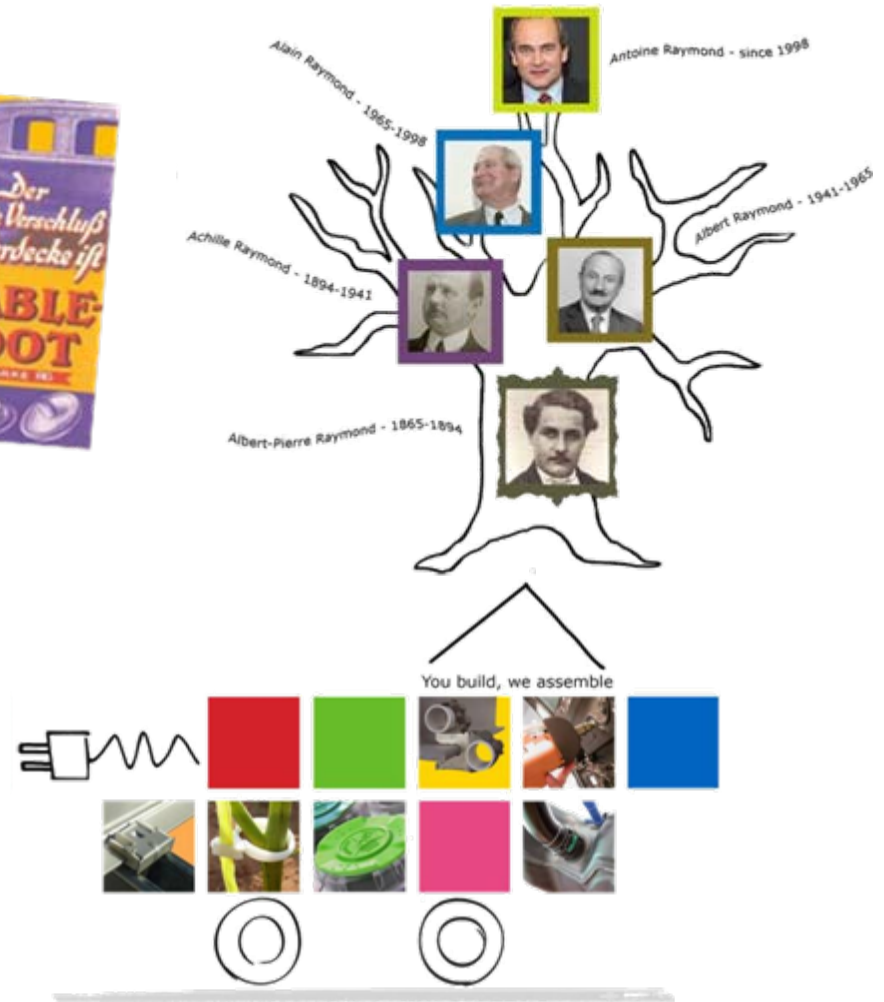
More than Fastening: Thermoelectric & Wireless Sensor Applications

Ryan Everett Ward



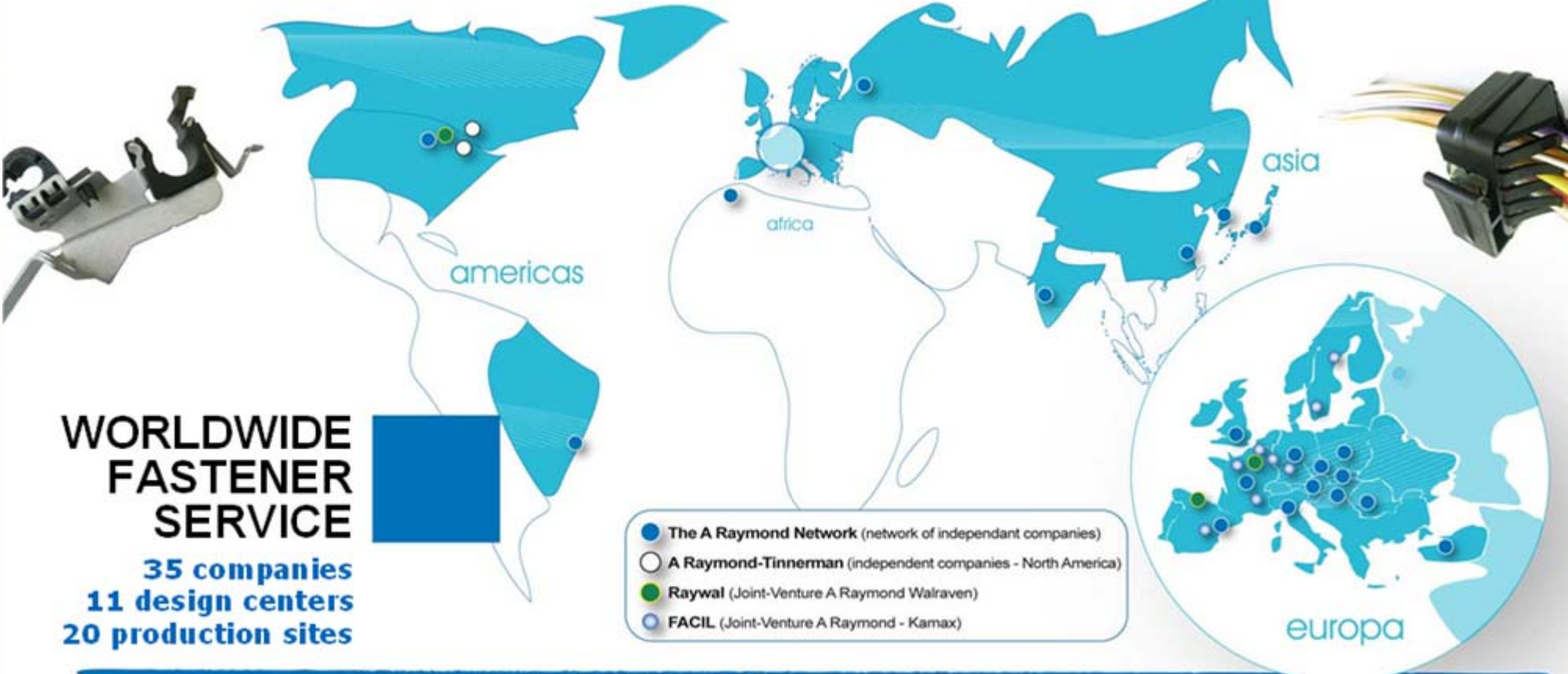
Introduction of ARaymond Network

- 1865** Foundation of the company ARaymond in Grenoble (F). Manufacturing and sales of metal products.
- 1886** Invention of the PUSH-BUTTON with crown design by Albert-Pierre Raymond.
- 1898** Foundation of the company ARaymond in Lörrach (D).
- 1936** Start of design and production of metal fasteners for the automotive industry.
- 1955** ARaymond began the plastic injection process.
- 1972** ARaymond expands internationally, presently residing in 21 countries.
- 2008** Creation of RayCE, ARaymond Center of Expertise.
- 2011** State-of-the-Art R&D (RayCE) Headquarters to be complete by July, located in Saint Louis (F).





A RAYMOND NETWORK



WORLDWIDE FASTENER SERVICE

35 companies
11 design centers
20 production sites

France, Germany, Spain, Italy, U.K, Belgium, Czech Republic, Turkey, Russia, U.S.A., Japan, South Korea, China, Brazil, India, Morocco, Romania, Poland, Hungary, Slovakia, Sweden...



EXPERTISE

MORE THAN FASTENING

Advanced assembly technology

Clip fasteners

Metal and plastic and combination of the two



Assembly process

RavNICE®

Nonstop Injected Clip Equipment
RayTOOL®, assembly gun



Bonding technology

Techbond®

High performance adhesives



Electrical applications

- Tape on clips, straps,
- Protecting channels and connectors caps...



Fluid handling

- Quick connectors,
- nozzles



Communicating fasteners

- Contain RFID technology (traceability)



Global product range

> 25.000 products

www.araymond.com - www.raywal-usa.com - www.raywal.es - www.raywal-france.com - www.raygreen.es - www.raybond.com - www.rayconnect.com



MEANS OF PRODUCTION

PROCESS TECHNOLOGIES



Metal, plastic and combination of both

Metal production

Engineered Clip fasteners
Spring steel brackets



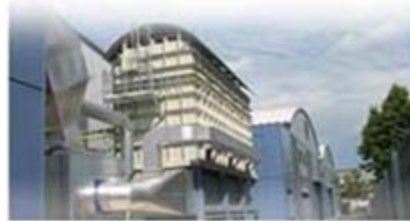
Production tools

Design and manufacture



Processing technologies

Stamping & forming
Surface treatment
Assembly



Plastic production

Engineered Clip fasteners,
Quick Connector components,
Washer jets, cable channels,
Customised materials i.e. AR-Bag®

Injection moulds

Design and manufacture

Process technologies

Injection moulding. Bi-injection,
Biodegradable plastic material,
Computerised production lines,
Ray-nice® "endless injection"

Automated assembly

Quick Connectors
And other products



www.araymond.com - www.rayconnect.com

14/04/2011

Ryan Everett Ward
Hall 8 / Booth D26



SERVICES

FULL SERVICE PROVIDER



To reduce costs and to make easy assembly operations

220 Product design Engineers worldwide

On site or at resident customers locations

Resident Sales and Engineers
coordinated by Global Account Managers



Products with added values
Multifunction, acoustic damping properties. Valves, sensors, RFID integrated...



Full Service Fastener Provider FACIL
A complete service from product engineering, supply chain to assembly line process



Products + Process

RayTOOL®,
a «cost-killing» gun!
Increase the productivity
Reduction in process and logistics costs

Global Manufacturing
Facilities in Europe, Asia, North and South America



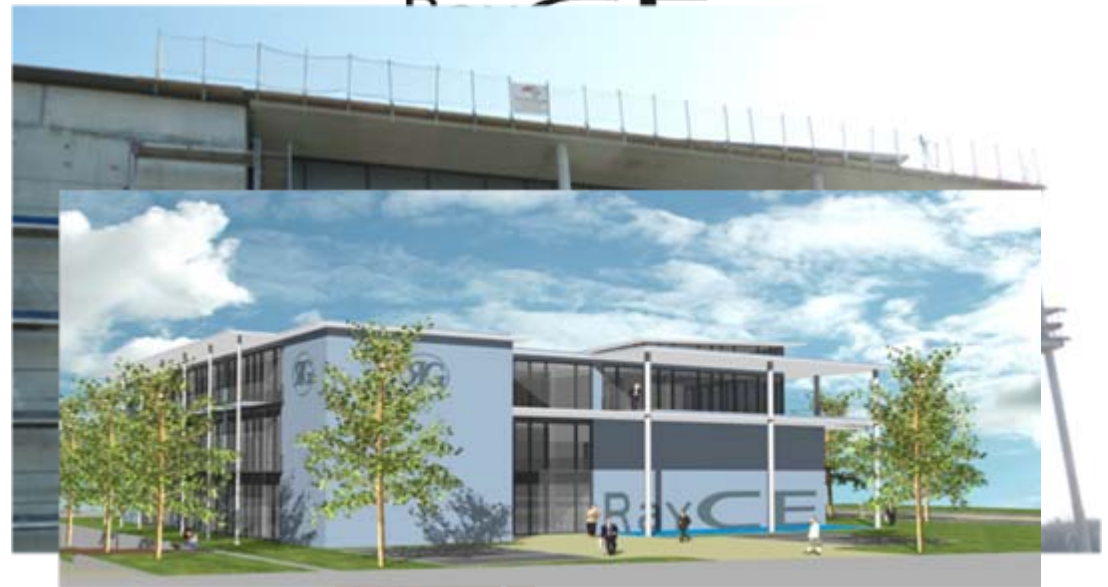
Partnership WALRAVEN
Complete solutions dedicated to building and distribution

www.araymond.com - www.facil.be - www.rayconnect.com - www.raybond.com - www.raywal-usa.com - www.raywal.es - www.raywal-france.com



Introduction of RayCE

- 2009** Foundation of RayCE, ARaymond Center of Expertise
- 2009** Under 10 Employees
- 2010** Construction for RayCE Headquarters begins in March.
- 2011** Over 30 R&D Engineers and Scientists working for RayCE.
- 2011** RayCE Headquarters to be complete by July, located in Saint Louis (F).





What are we doing here?

“I thought you produced fasteners?”

“Sensors?... A. Raymond?”

“Why?”

“What value do you bring to thermal harvesting?”

“Why Micropelt?”



INNOVATION

A NEW ADVANCED RESEARCH TEAM Raymond Center of Expertise

Collaborate to innovate

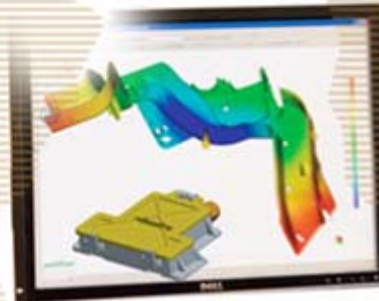


Network of expertise

- Interdisciplinary research teams,
- Network with partners,
- Participation in government promoted research projects.

Pilot plant

- Technologies & Process,
- Simulation & testing areas,
- Material development laboratory,
- Micro Electronic laboratory,
- International teams.



30 Scientists & Engineers working on advanced engineering projects

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Sensor Development

- **Since 2009**
- **Responding to Customer Demands (automotive)**
 - Reduce complexity
 - Less interfaces
 - Assembly time
 - Reduce mass & components
 - Compact design
 - Reduce costs

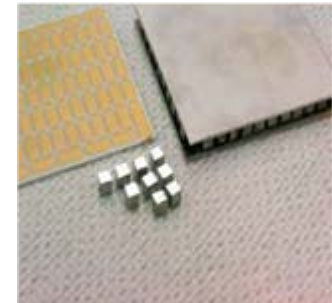
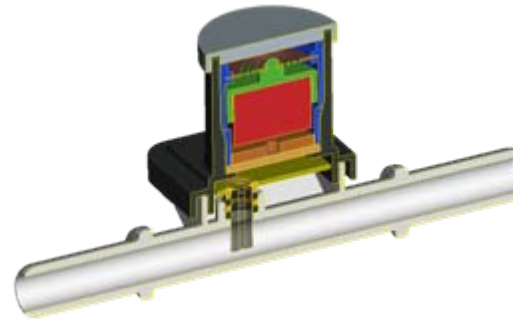
→ ADD VALUE
- **Pressure & Temperature for Fuel Applications**





Energy Harvesting

- **We believe in the technology...**
 - ... it's a “no-brainer”!
- **Why create more energy when it's all around us?**
 - Vibration
 - Heat
- **Economical**
 - The energy is FREE!
- **The technology has aligned...**
 - Power demands for sensors have decreased.
 - Energy harvesting is creating more usable power.
- **It's a Green Solution.**



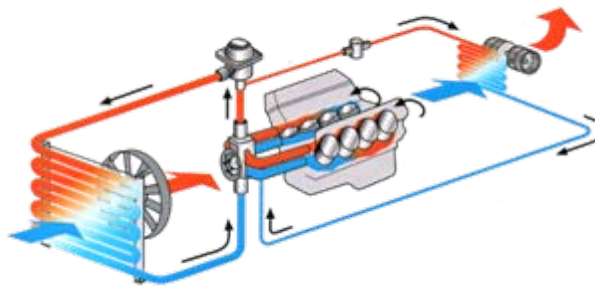


The Heat BiTe

- **A demonstrator intended for fluidic applications.**
 - i.e. Solar Thermal Panels, Automotive Cooling Systems
- **Based on the Micropelt/TE-Power Node**



- **No batteries & No wires!**





Our Contribution

- **Where we can add value to your end product...**
 - Microelectronics
 - Mechatronics
 - Injection Molding & Tool Design
 - Metal Stamping & Forming
 - Chemistry & Bonding
 - Packaging & Sealing
 - Industrialization & Assembly Expertise

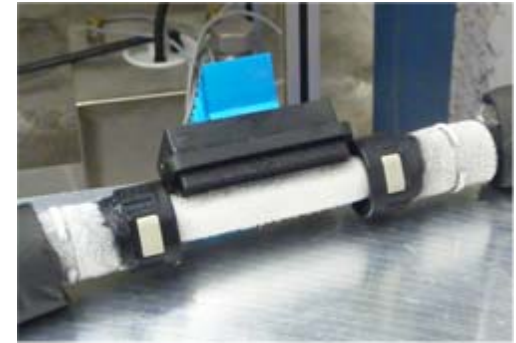




Qualifications

- **End Customer Requirements**

- Thermal Shock
 - 100 Full Cycle Evaluation from -20°C to 70°C
- Vibration
 - Shaker tests according to ISO 16750-3
- Leak Tightness
 - Protection rating of IP-47





What's your application?

- **The technology is demonstrated...**
- **The opportunities are extreme...**
 - Energy-efficiency demands more sensors
 - Installation and maintenance costs are show-stoppers
- **What's your application... how about?**
 - Remove the batteries... the wires...
 - Increase system monitoring
 - Improve opportunity value... long-term sustainability...
- **Let's discuss this @ Hall 8, Booth D26...**

We look forward to working with you!



ARAYMOND CENTER OF EXPERTISE

THANK YOU FOR YOUR TIME!

VIELEN DANK FÜR IHRE AUFMERKSAMKEIT!

QUESTIONS?

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